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behind this flannel curtain, through which sufficient light from the three lamps comes to enable the change to be made without further artificial light. The orange flannel serves to satisfactorily exclude actinic light.

The traces, removed from the cylinders, are then carried in a large envelope to the dark room, and there developed, the developer used being pyrogallic acid. The best developments are those which take place rather quickly, in about ten to fifteen minutes. When the development is slower, the traces are usually found inferior. After the development is complete, the traces are fixed in hyposulphite of soda, cleansed in a saturated solution of alum, washed for about two hours in running water, and then hung up to dry. After drying, the date is stamped upon them. The exact instant of beginning and ending of each line on the trace, together with the corresponding scale value, is written on. Time observations, with sextant and artificial horizon, are taken from time to time, usually monthly, to regulate the standard chronometer.

After the traces have been thus completed, they are practically paper negatives, from which any number of copies may be made photographically. Two sets are made by the well-known blue-print process. The traces require no special treatment, such as oiling, waxing, etc., for the successful application of this process.

For tabulating from the traces, it is found most convenient to use a ruler subdivided into hourly divisions for the time scale, and a triangular piece of card-board upon the edge of which is ruled the scale corresponding to the trace to be read. The unifilar and bifilar traces have all been read, tabulated, and the means calculated. The vertical-force traces have not yet been read.

There is also in the magnet-room of the observatory a thermograph, which records the temperature every half-hour. From the records produced by it, the time of maximum temperature in the observatory is found to be about five P.M., and the time of minimum temperature, about half-past eight A.M. At these hours the thermometers under the bell glasses and near the magnets are read; and from these readings it appears that the magnets are subjected to an average daily range of temperature of about $1\frac{1}{2}^{\circ}$ C.

On the 14th, 15th, and 16th of each month, observations are made to determine the absolute declination, dip, and intensity. These observations are made in the usual manner of taking such observations by field parties in the coast and geodetic survey. Monthly reports and returns of results are made to the superintendent of the survey.

The declinations and dips have all been computed, but the intensities only approximately as yet. The following table contains the declinations and dips resulting from the monthly absolute determinations. Each declination is the mean derived from the elongation on three successive days, and each dip is the mean of six sets with two needles on the same three days.

*U. S. magnetic observatory at Los Angeles,
lat. $34^{\circ}03'$, long. $118^{\circ}15'$ W. G.*

	Declination.	Dip.
1882, Sept. 14, 15, 16	$14^{\circ}35.5'$ E.	$59^{\circ}30.1'$
Oct. 14, 15, 16	33.7	30.2
Nov. 14, 15, 16	34.6	29.7
Dec. 14, 15, 16	32.7	31.6
1883, Jan. 14, 15, 16	35.1	30.8
Feb. 14, 15, 16	31.5	28.4
March 14, 15, 16	32.4	31.7
April 14, 15, 16	32.1	29.2
May 14, 15, 16	32.5	29.7

The horizontal intensity is approximately 5.97 in British units = 0.275 dyne.

U. S. magnetic observatory,
Los Angeles, Cal., June 1, 1883.

NOTES AND NEWS.

Professor Huxley has been elected president of the Royal society of London, in the place of Mr. Spottiswood.

— The recently issued report of the signal-office for 1881 contains a record of primary and secondary observing stations, established in that year in Alaska, with summaries of observations at some Alaskan stations in preceding years. There is also some account of the fitting-out of the Greely expedition to Lady Franklin Bay and that to Point Barrow. But the most important article for arctic students is the report of Prof. E. W. Nelson on the meteorology of St. Michaels, Norton Sound, where, as is well known, he had been stationed for four years; his leisure being employed in pursuing investigations into the natural history and ethnology of the region with the greatest energy, devotion, and success. The article itself being a summary and an abstract, with somewhat wider limits in regard to the treatment of auroras and the so-called 'polar band' formation of clouds, it will not be attempted to condense it here, but merely to call attention to some of its leading features. According to observations by Danenhower, the position (hitherto somewhat uncertain) of St. Michaels is latitude $63^{\circ} 28\frac{1}{4}'$, and longitude $162^{\circ} 04\frac{3}{4}'$ west. The mean annual temperature for the period is $25^{\circ}.5$ F. The highest observed temperature was 75° , and the lowest, -55° . A curious fact was noted with great regularity. In early winter darkness comes on between three and four P.M., and the temperature falls until about six P.M., when a *rise* follows of two or three hours' duration, and sometimes five or six degrees in extent, followed by the usual steady nocturnal fall. It does not result from changes in the wind, but may be due to greater radiation immediately after sunset from the land, resulting in local atmospheric movements, causing warmer air from the adjacent sea to flow in the vicinity of the station.

Alongshore, winds N., N.E., S., S.E., S.W., are most prevalent. Winds off the sea, N.W. and W., are the least frequent, not exceeding together over ten per cent of the whole. Topographical bias is, however, distinctly evident, as at most stations in Alaska.

The measured precipitation averaged twelve inches and a quarter, to which Mr. Nelson estimates a correction of one-half more must be added for unmeasurable drizzle and blown snow. The record and discussion of the aurora is a valuable contribution to the subject, and cannot be summarized. Thunderstorms are almost unknown. Lightning was observed but twice, and no thunder was heard during the whole period. It is referred to as reported common on the upper Yukon in summer; but in 1865-68, by the explorers of the Telegraph expedition on the upper part of the river, thunder and lightning were not observed on a single occasion. There are but two seasons at St. Michaels, — winter (October-May) and summer (the remaining five months). The sea is open until about Oct. 15; and the ice disappears in the spring, usually in early June. The tides are small, but over the shallow sea adjacent the rise in level due to gales is often sufficient to submerge the marshy shores for miles inland. Gardening is not a success, except for turnips, radishes, and lettuce. The earliest birds, chiefly geese, begin to arrive in April; and the migration continues to June, the main body of birds arriving between May 15 and 25. Most of the birds leave for the south in August, and the first sharp frost of September sends away the laggards.

— On the 1st of January, 1883, there were in existence 79 societies of geography, distributed all over the world, with about 38,000 members.

— The American society of mechanical engineers met at Cleveland, O., June 14, President E. D. Leavitt, jun., of Cambridge, Mass., in the chair. Eighty members were present, and fifty-four were elected, raising the total membership to four hundred and sixteen. The papers were generally short, plain, and practical. Mr. J. K. Holloway described a steam starting gear for throwing marine engines 'off the centre.' It consists of a steam-cylinder and a friction-wheel on the main shaft, which can be actuated by the auxiliary steam-cylinder. The device works either way, and may be applied repeatedly if necessary. Mr. Charles N. Comly detailed his experience with lubricating materials, resulting in the substitution of grease for oil. Other members had found grease the cheaper lubricant, but had observed that it had a much higher coefficient of friction than oil. Mr. J. E. Sweet described a new method of casting iron pipe having flanges, making chilled flange-faces and cored bolt-holes. Other papers remain to be reported. During the session, it was announced that an honorary degree had been conferred on President Leavitt by the Stevens institute of technology.

— W. H. Edwards announces that he will not, at present, complete the Synopsis of species commenced in the tenth part of his Butterflies of North America, but substitute for it a mere list of species, which will be issued with the next (concluding) part of the second series.

RECENT BOOKS AND PAMPHLETS.

Annuaire de l'électricité pour 1883. (1re année), par A. Révérend. Paris, *Gauthier-Villars*, 1883. 216 p., illustr. 8°.

Blanchet. Notice sur la naturalisation à Bayonne d'une nouvelle plante exotique. Dax, *impr. Justère*, 1883. 15 p. 8°.

Delfau. De la maladie de la vigne causée par le phylloxéra et de son traitement efficace, facile et économique. Perpignan, *impr. de l'Indépendant*, 1883. 34 p. 8°.

English, T. Alfred, Haussen, C. Julius, and Sturgeon, J. Report on a scheme for supplying compressed air motive-power in the town of Birmingham; with tables and formulae for calculating the useful effect obtained from compressed air, and examples and diagrams showing the application thereof; with confirmatory report by Prof. H. Robinson. New York, *Spon*, 1883. 60 p., illustr. 4°.

Farmer, E. J. The resources of the Rocky Mountains; being a brief description of the mineral, grazing, agricultural, and timber resources of Colorado, Utah, Arizona, etc. Cleveland, 1883. illustr. 8°.

Forbes, P. R. Sciences and spiritualism. Paris, *impr. Schlaeber*, 1883. 16 p. 8°.

Forestier, C. Parallèle entre l'instruction des sourds-muets par le langage des signes et leur enseignement par l'articulation artificielle, suivi de quelques observations sur la méthode du célèbre Périère et sur les résolutions qu'a votées contre l'enseignement par le langage des signes le congrès international tenu à Milan du 6 au 12 septembre 1880 pour l'amélioration du sort des sourds-muets. Lyon, *impr. Pitrat*, 1883. 8+90 p. 8°.

Frankland, P. F. Agricultural chemical analysis. Founded upon 'Leitfaden für die agriculturchemiker,' von Dr. F. Krocke. London, *Macmillan*, 1883. 320 p. 8°.

Guenot, C. Les chinois et les indous. Limoges, *Barbou*, 1883. Bibliothèque morale. 87 p. 12°.

India-rubber and gutta-percha and their cultivation. London, *Haddon*, 1883. 8°.

Jaffré, P. Théorie complète élémentaire des occultations. Saint Nazaire, *impr. Fronteau*, 1883. 24 p., pl. 4°.

Keeping, W. The fossils and paleontological affinities of the neocomian deposits of Upware and Brickhill; with plates: being the Sedgwick prize essay for 1879. London, *Cambridge warehouse*, 1883. 8°.

Knight, D. Morphology of the vertebrata. With plates. London, *Dryden*, 1883. 8°.

Kuropatkin. Kashgaria (Eastern or Chinese Turkestan): Historical, geographical, military, and industrial. Translated by Major Gowan. London, *Thacker*, 1883. 8°.

Ladureau, A. L'acide sulfureux dans l'atmosphère de Lille. Lille, *impr. Danel*, 1883. 8 p. 8°.

Leplay, H. L'Osmose et l'osmogène Dubrunfaut dans la fabrication et le raffinage des sucres. Paris, *impr. Dubreuil*, 1883. 104 p. 8°.

Macrobe, A. La flore pornographique, glossaire de l'école naturaliste extrait des œuvres de M. Émile Zola et de ses disciples. Paris, *Doubletzerie*, 1883. 230 p., illustr. 18°.

Merrifield, J. A treatise on navigation, for the use of students. London, *Longmans*, 1883. 306 p. 8°.

Miller, W. The heavenly bodies: their nature and habitability. London, *Hodder*, 1883. 354 p. 8°.

Murgue, Daniel. The theories and practice of centrifugal ventilating machines. Translated and with an introduction by A. L. Stevenson. New York, *Spon*, 1883. 81 p. 8°.

Owen, T. C. Notes on cardamon cultivation. London, *Haddon*, 1883. 8°.

— The cinchona planter's manual. London, *Haddon*, 1883. 8°.

Pickering, E. C. Elements of physical manipulation. Parts 1, 2. London, *Macmillan*, 1883.

Rowan, T. Disease and putrescent air: some principles which must govern the efficient ventilation of sewers, and the effective hygienic treatment of sewer-gas; also the sanitary ventilation of house drains and connections. New York, *Spon*, 1883. 47 p. 8°.

Roy, C. Destruction des phylloxéras par le sulfure de carbone au moyen des cubes gélatineux, exposé scientifique et pratique. Bordeaux, *Feret*, 1883. 40 p. 8°.

Scientific Californian. Vol. 1, no. 1. San Francisco and Oakland. 14 p., illustr. 4°. m.

Scott, J. Draining and embanking: a practical treatise embodying the most recent experience in the application of improved methods. (Weale's series.) London, *Lockwood*, 1883. 132 p. 12°.

Smyth, W. W. Evolution explained. London, *Stock*, 1883. 8°.

Watt, A. The history of a lump of chalk: its family circle and their uses. London, *A. Johnston*, 1883. 96 p., illustr. 12°.

Witz, A. L'École pratique de physique, cours de manipulations de physique préparatoire à la licence. Paris, *Gauthier-Villars*, 1883. 14+506 p., illustr. 8°.